

# MATERIAL SAFETY DATA SHEET

## 1. SUBSTANCE AND SOURCE IDENTIFICATION

National Institute of Standards and Technology  
Standard Reference Materials Program  
100 Bureau Drive, Stop 2320  
Gaithersburg, Maryland 20899-2320

SRM Number: 1751  
MSDS Number: 1751  
SRM Name: Gallium for Melting-Point  
Standard

Date of Issue: 01 September 2004

MSDS Coordinator: Carmen Davis  
Telephone: 301-975-6776  
FAX: 301-926-4751  
E-mail: SRMMSDS@nist.gov

Emergency Telephone ChemTrec:  
1-800-424-9300 (North America)  
+1-703-527-3887 (International)

**Description:** Standard Reference Material (SRM) 1751 is intended primarily for use as one of the defining fixed points of the International Temperature Scale of 1990 (ITS-90). Each unit of SRM 1751 consists of 200 g of gallium sealed in an argon atmosphere in a plastic bottle.

**Substance:** Gallium

**Other Designations:** Gallium (gallium metal; gallium element)

## 2. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

**Component:** Gallium  
**CAS Number:** 7440-55-3  
**EINECS:** 231-163-8

**SRM Nominal  
Concentration (mass %):** 100

**EC Classification:** None listed.

**EC Risk:** None listed.

**EC Safety:** None listed.

## 3. HAZARDS IDENTIFICATION

**NFPA Ratings (Scale 0-4):** Health = 1      Fire = 0      Reactivity = 0

**Major Health Hazards:** No significant target effects reported.

### Potential Health Effects

**Inhalation:** Inhalation may cause irritation of the mucous membranes. No data is available for chronic exposure.

**Skin Contact:** Skin contact may cause irritation. No data is available for chronic exposure.

**Eye Contact:** Eye contact may cause irritation. No data is available for chronic exposure.

**Ingestion:** Gallium is poorly absorbed by the gastrointestinal tract. No data is available for chronic exposure.

### Listed as a Carcinogen/ Potential Carcinogen:

Yes    No

\_\_\_\_\_ X    In the National Toxicology Program (NTP) Report on Carcinogens.

\_\_\_\_\_ X    In the International Agency for Research on Cancer (IARC) Monographs.

\_\_\_\_\_ X    By the Occupational Safety and Health Administration (OSHA).

---

#### 4. FIRST AID MEASURES

---

- Skin Contact:** Rinse affected area with copious amounts of water for at least 15 minutes while removing contaminated clothing. Obtain medical assistance if necessary.
- Eye Contact:** Immediately flush eyes, including under the eyelids, with copious amounts of water for at least 15 minutes. Obtain medical assistance immediately.
- Inhalation:** If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing by qualified personnel. Get immediate medical attention.
- Ingestion:** If a large amount is swallowed, obtain immediate medical assistance.
- 

#### 5. FIRE FIGHTING MEASURES

---

- Fire and Explosion Hazards:** Gallium is a negligible fire hazard.
- Extinguishing Media:** Use regular dry chemical, carbon dioxide, water, or regular foam.
- Fire Fighting:** **DO NOT** touch spilled material. Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Use extinguishing agents appropriate for surrounding fire. Do not get water directly on material. Apply water from a protected location or from a safe distance. Avoid inhalation of material or combustion by-products.
- Flash Point (°C):** Not applicable.
- Method Used:** Not applicable.
- Autoignition Temp. (°C):** Not applicable.
- Flammability Limits in Air**
- UPPER (Volume %):** Not applicable.
- LOWER (Volume %):** Not applicable.
- 

#### 6. ACCIDENTAL RELEASE MEASURES

---

- Occupational Release:** **DO NOT** touch spilled material. Move containers away from spill to a safe area. Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal.
- Disposal:** Refer to Section 13, "Disposal Considerations".
- 

#### 7. HANDLING AND STORAGE

---

- Storage:** Store and handle in accordance with all current regulations and standards. Unopened SRM 1751 may be stored in a normal laboratory environment. An opened unit should be stored in a dry box containing an inert gas (preferably argon) to prevent oxidations and possible contamination. Keep separated from incompatible substances.
- Safe Handling Precautions:** See Section 8, "Exposure Controls and Personal Protection".
- 

#### 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

---

- Exposure Limits:** **Gallium**  
No occupational limits established.
- Ventilation:** Use a local exhaust ventilation system. Ensure compliance with applicable exposure limits.
- Respirator:** For conditions of frequent use or heavy exposure where exposure is apparent and engineering controls are not feasible, respirator protection may be needed. Refer to the "NIOSH Guide to the Selection and Use of Particulate Respirators Certified under 42 CFR 84" for selection and use of respirators certified by NIOSH.
- Eye Protection:** Wear safety goggles. **DO NOT** wear contact lenses in the laboratory. An eye wash station should be readily available near areas of use.

**Personal Protection:** Wear appropriate protective clothing and chemically resistant gloves to prevent skin exposure.

---

## 9. PHYSICAL AND CHEMICAL PROPERTIES

---

**Component:** Gallium

**Appearance and Odor:** Blue, white color. Odorless. Moisture-sensitive material causing change in appearance.

**Relative Molecular Weight:** 69.72 g/mol

**Molecular Formula:** Ga

**Density:** 5.9 g/cm<sup>3</sup>

**Solvent Solubility:** Soluble in acids. Slightly soluble in mercury. **Insoluble** in alkali.

**Water Solubility:** Insoluble.

**Melting Point:** 30 °C

---

## 10. STABILITY AND REACTIVITY

---

**Stability:**  Stable  Unstable  
Stable at normal temperatures and pressure.

**Conditions to Avoid:** Avoid heat, flames, sparks and other sources of ignition.

**Incompatible Materials:** Gallium is incompatible with acids, bases, halogens and oxidizing materials. Contact with halogens causes a violent exothermic reaction. Contact with hydrogen peroxide and hydrochloric acid will produce an explosively violent reaction.

**Fire/Explosion Information:** See Section 5, "Fire Fighting Measures".

**Hazardous Decomposition:** Hydrogen.

**Hazardous Polymerization:**  Will Occur  Will Not Occur

---

## 11. TOXICOLOGICAL INFORMATION

---

**Route of Entry:**  Inhalation  Skin  Ingestion

**Mutagenic Data:** Human lymphocyte DNA inhibition: 480 µmol/L

**Medical Conditions Aggravated by Exposure:** No data available.

**Health Effects (Acute and Chronic):** See Section 3: "Hazards Identification" for potential health effects.

---

## 12. ECOLOGICAL INFORMATION

---

**Ecotoxicity Data:** No data available.

---

## 13. DISPOSAL CONSIDERATIONS

---

**Waste Disposal:** Dispose in accordance with all applicable federal, state, and local regulations.

---

## 14. TRANSPORTATION INFORMATION

---

**U.S. DOT and IATA:** Gallium; UN2803; Hazard Class 8; Packing Group III; Label Requirements 8.

**Canadian Transportation or Dangerous Goods:** Gallium; UN2803; Class 8; Packing Group/Risk Group III.

---

**Land Transport****ADR and RID:** Gallium; UN2803; Class 8; Classification Code C10; Packing Group III; Labels 8.**Maritime Transport:** Gallium; UN2803; Class/Division 8; Labels 8; Packing Group III.

---

**15. REGULATORY INFORMATION**

---

**U.S. Regulations:** CERCLA Sections 102a/103 (40 CFR 302.4): Not regulated.  
SARA Title III Sections 302, 304, 313: Not regulated.  
OSHA Process Safety (29 CFR 1910.119): Not regulated.  
California Proposition 65: Not regulated.  
SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):  
ACUTE: No.  
CHRONIC: No.  
FIRE: No.  
REACTIVE: No.  
SUDDEN RELEASE: No.

**CANADIAN Regulations:** WHMIS Classification: Not determined.

**EUROPEAN Regulations:** EC Classification: Not determined.

**National Inventory Status**

**U.S. Inventory (TSCA):** Listed on inventory.

**TSCA 12 (b)**

**Export Notification:** Not listed.

---

**16. OTHER INFORMATION**

---

**Sources:** MDL Information Systems, Inc., MSDS *Gallium*, 19 March 2003.

**Disclaimer:** Physical and chemical data contained in this MSDS are provided only for use as a guide in assessing the hazardous nature of the material. The MSDS was prepared carefully, using current references; however, NIST does not certify the data in the MSDS. The certified values for this material are given in the NIST Certificate of Analysis.